KINGDOM MONERA

- **Examples**: bacteria, blue-green algae (cyanobacteria)
- Very _________ in size (about 1 micrometre)
- Prokaryotic – The genetic material (DNA) is not enclosed in a distinct nuclear ________.
- Cell shapes can be round (“coccus” e.g. in streptococcal throat infection), rod-shaped (“__________” e.g. *Escherichia coli* which normally lives in the human gut), or spiral-shaped (“spirillum” e.g. in cholera)
- Some of the rod- or spiral-shaped bacteria may ____________ by means of a whiplike flagellum (plural: ____________)
- Many can survive unfavourable conditions such as extreme dryness or heat by producing an extra _________ coat.
- Most reproduce asexually by binary fission approximately every _______ minutes. The bacterium duplicates its genetic material (DNA) and then splits into 2 smaller ____________.
- Some are autotrophic, i.e. produce their own nutrients from ________ (photosynthetic), from sulphur or iron (chemosynthetic).
- Some are heterotrophic, i.e. obtain their nutrients by absorbing them from other living organisms (e.g. pathogenic or ____________ bacteria that produce toxins).
- Some require ____________ to live (aerobic), and some do not (anaerobic).
- Some are harmful (e.g. disease-causing or ____________ bacteria), and some are useful (e.g. ____________ bacteria which rot dead matter to recycle nutrients into the soil).
KINGDOM PROTISTA

• Examples: **Amoeba, Paramecium, Euglena, Volvox, protozoa, and some algae**
• Microscopic but larger than Monerans
• Eukaryotic – Inside the cell, there are specialised structures called ____ which are surrounded by membranes, such as nucleus (containing _), chloroplasts (for__ ____________), and mitochondria (for respiration).
• Most are single-celled or ________________. This means that each protist cell exists as an individual with no cooperation with other cells. Unicellular cells, however, can live linked to other cells in filaments or colonies.
• Some move by whiplike _____________________, and others move by hairlike cilia.
• Some can photosynthesise like a plant, some ingest food like an animal, and some can absorb nutrients like fungi.

xceleratescience.com
KINGDOM FUNGI

- Examples: mushrooms, yeast, tinea (Athlete's Foot)
- All are eukaryotic.
- All are heterotrophic, and therefore many are decomposers.
- Some are unicellular, and some are multicellular.
- Most are composed of threadlike _______________ that grow by elongation and branching. A mass of hyphae is called a ____________ such as in the “fruiting” structure of the mushroom.
- Most reproduce by ______________.
KINGDOM PLANTAE

**PHYLUM / DIVISION BRYOPHYTA**
- Examples: moss, liverwort, hornwort
- Non-vascular
- Has no true roots, stems nor leaves
- Absorb ___________ and nutrients directly from the surroundings
- Aquatic or moist terrestrial habitat
- Usually less than _________ cm in size

**PHYLUM / DIVISION TRACHEOPHYTA**
- Eukaryotic
- Multicellular
- Vascular – has vessels carrying nutrient-rich sap and water
- Has true, roots stems and leaves

**CLASS FILICOPSIDA (FERNS)**
- Vascular, tracheophyte
- Has true roots, stems and leaves
- Damp, shady terrestrial habitat
- Leaves are situated on ___________
- On the underside of the leaves are brown spots called sor, containing ________
- The underground stem is called the ___________

**CLASS CYCADOPSIS (CYCADS)**
- Vascular, tracheophyte
- Has true roots, stems and leaves
- Palm-like plant
- Reproduce by seed inside a ___________
- Gymnosperm = “Naked Seed” (i.e. The seed is not enclosed in an ovary.)

**CLASS GINKGOPSIDA (GINKGOS)**
- Example: maiden-hair tree
- Vascular, tracheophyte
- Has true roots, stems and leaves
- Fan-shaped deciduous leaves
- Reproduce by ___________
- Gymnosperm = “Naked Seed” (i.e. The seed is not enclosed in an ovary.)
CLASS CONIFEROPSIDA (CONIFERS)
- **Examples**: pine, oak, fir, cedar
- **Vascular, tracheophyte**
- **Has true roots, stems and leaves**
- **Terrestrial**
- **Needle-like leaves**
- **Reproduce by ___________ inside a ___________**
  - **Gymnosperm** = “Naked Seed” (i.e. The seed is not enclosed in an ____)

CLASS ANGIOSPERMAE (FLOWERING PLANTS)
- **Examples**: rose, iris, carrot, grasses, eucalypt
- **Vascular, tracheophyte**
- **Has true roots, stems and leaves**
- **Aquatic or terrestrial**
- **Often pollinated by ___________**
  - **Angiosperm** = “Enclosed Seed” (i.e. The seed is enclosed in an ovary.)
  - When the male pollen of a flower pollinates the female egg in the ovary of a flower, a seed forms. Then the ovary enlarges into a fruit that forms around the seed.
- **There are 2 subclasses of Angiosperms – Monocotyledons and _______**
KINGDOM ANIMALIA

INVERTEBRATE ANIMALS

**PHYLUM PORIFERA**

- Examples: sponges
- Invertebrate
- Multicellular
- Mostly marine, some freshwater
- A sponge consists of an outer layer of covering cells, an inner layer of flagellated cells, and some cells in between. Water moves in through many small ________, and out through one large pore. Nutrients and oxygen are absorbed directly from the ________________ into the cells.

**PHYLUM CNIDARIA / PHYLUM COELENTERATA**

- Examples: jellyfish, coral, hydra, sea anemone
- Invertebrate
- The name “Cnidaria refers to ____________ cells (called cnidocytes) on the tentacles. The name “Coelenterata” refers to the _______ body
- Marine
- Some are fixed (e.g. coral), and some are free-swimming (e.g. jellyfish).
- Radial symmetry (e.g. Top view of jellyfish)
- A branched central cavity digests nutrients. There is no separate mouth and anus.
- Absorb ____________ directly from the water into the cells

**PHYLUM PLATYHELMINTHES (FLATWORMS)**

- Examples: tapeworm, liver fluke, planarian
- Invertebrate
- Most are parasitic and live inside a ________ animal. However, planarians are free-living and live in marine, freshwater and moist terrestrial environments.
- Bilateral symmetry
- “Head” contains sensory organs for sight and hearing and a simple brain
- Digestive tract is sac-like with one opening, which has a _______ in most of the parasites
PHYLUM NEMATODA (ROUNDWORMS)

- Examples: threadworm (Ascaris), hookworm
- Invertebrate
- Bilateral
- Unsegmented
- Parasitic
- Terrestrial, freshwater or marine

PHYLUM NEMERTEA (RIBBON WORMS / PROBOSCIS WORMS)

- Invertebrate
- Bilateral symmetry
- Marine
- Can be 15 cm or more in length
- “Head” contains a simple brain, and an extendable ____________ which is used to capture prey (often other worms)
- Digestive tract has two openings – a mouth and an ____________

PHYLUM BRYOZOA (MOSS ANIMALS)

- Invertebrate
- Bilateral symmetry
- Marine, can be mistaken for seaweed
- Fixed vase-like body with a U – shaped digestive tract with separate mouth and anus at the top
- Mouth is surrounded by tentacles to trap ____________
- Body is enclosed in calcium carbonate material for protection

PHYLUM MOLLUSCA

- Examples: slug, snail, clam, oyster, chiton, squid, octopus
- Invertebrate
- Soft-bodied muscular “foot”, usually enclosed with a hard external shell made of calcium ____________
- Breathe with gills
- Digestive system – Mouth with jaws and a tongue-like radula with teeth on it, also a stomach, intestine and anus

xceleratescience.com
**PHYLUM ANNELIDA (SEGMENTED WORMS)**

- **Examples:** bristle worm, earthworm, leech
- Invertebrate
- Bilateral symmetry
- More advanced than the other worm phyla because of a ______________, which is an internal fluid-filled body cavity
- Digestive tract is straight, with separate mouth and anus
- Head has simple brain, and may have simple eyes, feelers or tentacles
- Sexual reproduction, and Earthworms and Leeches are ______________ but do not self-fertilise.

**PHYLUM ARTHROPODA**

- Largest phylum in the animal kingdom
- Invertebrate
- External skeleton (______________)
- Segmented body
- Jointed appendages
- Ventral nerve cord

**CLASS CRUSTACEA**

- **Examples:** crab, lobster (crayfish), shrimp (prawn), barnacle, water flea, slater
- Invertebrate, ventral nerve cord
- Mostly aquatic
- Body segments are cephalothorax and abdomen
- Each body segment has a pair of jointed limbs that may be used for swimming, crawling or ______________
- Bilateral symmetry
- 2 pairs of antennae
- 1 pair of jaws
- Heart and blood vessels
- Gills for _____________
- Straight digestive tract with separate mouth and anus
- Simple brain and sensory organs
CLASS MYRIAPODA
- **Examples**: centipede, millipede
- Invertebrate, ventral nerve cord
- Bilateral symmetry
- 1 pair of antennae
- Brain and sensory organs of eyes, feelers and skin
- Air tubes called tracheae for __________
- Heart and blood vessels
- Straight digestive tract with separate mouth and anus
- Sexual reproduction, with separate sexes
- This group is sometimes divided into two classes – Class Chilopoda (Centipedes) and Class Diplopoda (__________).

CLASS ARACHNIDA / CLASS CHELICERATA
- **Examples**: spider, scorpion, tick, mite
- Invertebrate, ventral nerve cord
- Usually terrestrial
- Bilateral symmetry
- 2 body segments – Prosoma (with sense organs, mouthparts and limbs, but no antennae) and abdomen
- Usually 4 pairs of ________________
- Poison fangs are called ______________
- Breathe with book lungs (similar to gills)
- Sexual reproduction

CLASS INSECTA
- **Examples**: beetle, weevil, fly, mosquito, midge, cicada, aphid, bee, ant, termite, butterfly, praying mantis, dragonfly, grasshopper, locust, cricket, flea, silverfish, cockroach
- Invertebrate, ventral nerve cord
- Largest class in the ____________ kingdom
- Bilateral symmetry
- 3 body parts – head (with 1 pair of antennae, 1 pair of jaws and eyes), thorax (with 3 pairs of ____________) and abdomen
- Breathe by tracheae
- Heart and blood vessels
- Straight digestive tract with separate mouth and anus
- Brain and specialised sensory organs
- Sexual reproduction – Some insects such as bees produce offspring by parthenogenesis also. Many insects produce chemicals called pheromones to attract mates.
**PHYLUM ECHINODERMATA**

- Examples: starfish, sea cucumber, sea urchin, sand dollar
- Invertebrate
- Radial symmetry
- Marine
- “Spiny skin”
- Mouth surrounded by 5 arms with tube feet that move by a ________ system
- Internal structure made of calcium _____________
- Well-developed digestive system
- Simple nervous and circulatory system

**VERTEBRATE ANIMALS**

**PHYLUM CHORDATA**

- Vertebrate
- Internal skeleton of either cartilage or bone _________________
- Dorsal nerve cord
- Complex nervous, digestive, circulatory skeletal, muscular and excretory systems

**FISH**

- Examples: Cartilaginous fish( shark, ray, lungfish) and Bony fish (barramundi, trout)
- Vertebrate, dorsal nerve cord
- Bilateral symmetry
- Marine or __________________________ (ectothermic)
- Stream-lined shape
- Skin covering is ________________
- Fins
- Buoyancy control by means of a gas bladder
- Respiratory system - Breathe by ______________
- Nervous system – Brain and spinal cord
- Digestive system – Mouth, pharynx, oesophagus, stomach, intestine, anus
- Circulatory system – 2 chambered _____________ and blood vessels
- Sexual reproduction, Fertilisation (joining of sperm and ______________) is mostly external.
CLASS AMPHIBIA
- **Examples**: frog, toad, salamander, newt
- Vertebrate, dorsal nerve cord
- Bilateral symmetry
- Metamorphosis – Egg $\rightarrow$ Larva (Tadpole) $\rightarrow$ ____________
- Habitat is freshwater during egg and larval stages, and moist ________ areas during adult stage
- Changing body temperature (__________)
- Moist skin covering
- Respiratory system – Breathe through gills and moist skin during larval stage, and through lungs and moist skin during adult stage
- Nervous system – Brain and spinal cord
- Digestive system – similar to more complex chordates
- Circulatory system – similar to more complex chordates, but with a 3 chambered heart
- Sexual reproduction – Fertilisation is___________. Jelly-like eggs are laid in water.

CLASS REPTILIA
- **Examples**: snake, lizard, tortoise, turtle, crocodile
- Vertebrate, dorsal nerve cord
- Bilateral symmetry
- Changing body temperature (ectothermic)
- Skin covering is scales that may be joined into plates
- Breathe with ____________
- Nervous system – Brain and spinal cord
- Digestive system – similar to higher chordates
- Circulatory system – similar to higher chordates, but with a 3 chambered heart
- Excretory system – Urinary bladder present only in turtles, tortoises and lizards
- Sexual reproduction, most lay __________
CLASS AVES (BIRDS)

- **Examples:** kookaburra, eagle, pelican, cormorant, emu, penguin
- Vertebrate, dorsal nerve cord
- Bilateral symmetry
- Constant body temperature (____________)_
- Skin covering is ____________, but the feet are covered by scales
- Breathe with ___________
- The nervous, digestive (toothless), circulatory (with 4 chambered heart), skeletal (light strong bones), muscular and excretory (no sweat ____________) systems are similar to higher chordates.
- Sexual reproduction – Lay hard-shelled ___________
- Most can fly

CLASS MAMMALIA

- **Examples:** Egg-laying Monotremes (platypus, echidna), Pouched Marsupials (bandicoot, koala, kangaroo, wombat), and Placentals with umbilical cord (human, dog, horse, whale)
- Vertebrate, dorsal nerve cord
- Bilateral symmetry
- Most are terrestrial
- Constant body ____________ (homoiothermic, endothermic)
- Skin covering is hair or ___________
- The young are nourished with milk from ____________ glands of the mother.
- Complex nervous, digestive, circulatory, respiratory (lungs and muscular diaphragm) and excretory systems
- Most have 2 pairs of ____________, usually legs, although some have modified appendages for swimming (e.g. seal) or flying (e.g. bat).
- Sexual reproduction, ____________ fertilisation